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(54) **Transverse direction zipper tape**

(57) A zipper strip for a reclosable package having a transverse zipper is provided. The zipper strip comprises a male interlocking profile (12) and a female interlocking profile (14). Each profile includes an interlocking member (16,18) and an integral web which defines

a leading flange. The leading flanges (22,24) are sealed to thermoplastic film material which is used to make the reclosable packages and to each other. One of leading flanges is provided with a perforation (32) along its length so that it can be separated by pulling the profiles apart.

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Description

[0001] The present invention relates to reclosable plastic bags and packages of the type in which food products, such as crisps otherwise known as chips and cereal, and other goods are packaged for sale to consumers. More particularly, the present invention relates to a reclosable zipper strip for use in transverse-zippered reclosable plastic bags made on form-fill-seal (FFS) machines.

[0002] The present invention relates to improvements in the package-making art and may be practiced in the manufacture of thermoplastic bags and packages of the kind that may be used for various consumer products, but which are particularly useful for food products which must be kept in moisture and air-tight packages, free from leakage until initially opened for access to the product contents, which packages are then reclosable by zipper means to protect any remainder of the product therein.

[0003] The prior art is fairly well-developed, but nevertheless remains susceptible to improvement contributing to increased efficiency and cost effectiveness.

[0004] In particular the present invention relates to the area of reclosable packaging known as the transverse zipper. When making a bag with a transverse zipper, the zipper is attached transverse to the longitudinal axis of the material used to make the bag, as opposed to being attached to the material parallel to the longitudinal axis. A method and apparatus for making reclosable plastic bags with a transverse zipper on a FFS machine is disclosed in U.S. Patent No. 4,909,017.

[0005] Prior to the introduction of the transverse zipper to the reclosable packaging field, reclosable plastic bags made on FFS machines were typically made with a longitudinal zipper, i.e. a zipper parallel to the longitudinal axis of the thermoplastic film used to make the bags. However, there are two primary problems with the longitudinal zipper. First, there is a problem in attaining satisfactory sealing of the bags against leakage since the transverse, or side, sealing bars of the FFS machine must flatten and seal the zipper at the same time they are sealing the thermoplastic film from which the packages are being made. The difficulty with which this sealing is consistently and successfully achieved is reflected by the high occurrence of leaking packages.

[0006] Second, the length of reclosable bags made on FFS machines when the zipper is attached parallel to the longitudinal axis of the thermoplastic film is limited to the diameter of the filling tube of the FFS machine. Thus, generally bags of this type are wider than they are long. While such bags are suitable for certain products where shorter bags are desirable, such as cheese and chicken parts, these bags are not suitable for applications in which longer bags are desirable, for example chips and other snack foods.

[0007] Among the approaches taken to solve these problems has been the substitution of a transverse zip-

per for the longitudinal zipper. When a transverse zipper is provided, the transverse sealing bars associated with the FFS machine do not flatten the zipper during formation of the top and bottom seals of the package since the transverse sealing bars may seal the zipper to the thermoplastic sheet material transversely thereacross without contacting the zipper. In addition, when a transverse zipper is used the length of the packages made on the FFS machine can be varied and is not limited to the diameter of the filling tube.

[0008] The present invention relates to a particular type of zipper strip which may be used in transverse zipper applications, a method for attaching the zipper strip to the thermoplastic film, and a method for making reclosable bags using the zipper-equipped thermoplastic film.

[0009] A typical zipper strip used in transverse zipper applications has interlocked male and female profiles. Each profile has an interlocking member and a laterally extending web defining a leading flange and a trailing flange on either side of the interlocking member. The zipper strip is initially secured to the thermoplastic film by sealing the leading flange of one of the profiles thereto. This allows the film to carry the zipper strip into the FFS machine where the bag is formed and the final seals are made. The problem with this approach, however, is that the leading flange which is not secured to the film has a tendency to flare out as the film enters the FFS machine and folds around the filling tube. The result of this flaring is that the unsecured leading flange has a tendency either to jam the FFS machine or to become caught on the machine and thereby cause the profiles to separate. While the zipper strip can be made without the second leading flange and thereby avoid this problem, the absence of this second leading flange and its subsequent attachment to the film can result in poor zipper opening mechanics and a weak seal between the zipper strip and the bag when the bag is opened for the first time by pinching the front and rear panels of the bag and pulling them apart (the current practice for opening snack packages). A four-flange seal, that is the male and female leading and trailing flanges being sealed to the bag walls, is the best and most secure method of attaching the zipper.

[0010] It is therefore an object of the present invention to provide a zipper strip for use in transverse-zippered reclosable plastic bags having two leading flanges which overcomes the aforementioned flaring problem. Another object of the present invention is to provide a method for attaching the zipper strip to the thermoplastic film such that there is no danger of jamming the FFS machine or separating the zipper as the transverse zipper-equipped film enters the FFS machine. Yet another object of the present invention is to provide a method of making reclosable bags using the transverse zipper-equipped film. Yet another object of the present invention is to provide a bag which utilizes the zipper strip.

[0011] Accordingly, the present invention is, in four as-

pects, a zipper strip for use with transverse zippered bags, a method for attaching the zipper strip to a continuous supply of thermoplastic film, a method for making reclosable bags on a FFS machine using the transverse zipper-equipped film, and a reclosable bag comprising the zipper strip.

[0012] In accordance with the first aspect of the present invention, the zipper strip includes a male profile and a female profile for mating with the male profile. The male profile includes a male interlocking member and a laterally extending web defining a leading flange. Likewise, the female profile includes a female interlocking member and a laterally extending web defining a leading flange. The male interlocking member is engageable within the female interlocking member to join the male and female interlocking profiles together.

[0013] One of the leading flanges is provided with a weak perforation along its length so that it can be separated by pulling the profiles apart. This will allow the user to separate the profiles when first opening the finished bag, as discussed below.

[0014] In the second aspect of the present invention, thermoplastic film is intermittently paid off a continuous supply of the same and fed into a FFS machine. A length of the interlocked zipper strip is attached to the flat film transverse to its longitudinal axis each time it is brought to rest as it advances in bag length increments. The strip is applied to the film with one of the profiles on top of the other profile with the leading flanges directed in the direction of motion of the film and is attached to the film by sealing the male and female leading flanges to each other and to the film on the side of the perforation opposite to the interlocking members. With both leading flanges secured to the film and to each other there is no danger of the FFS machine jamming or of the profiles becoming separated when the film enters the FFS machine. The zipper-equipped film may be rolled up and used on a FFS machine at a later time, or may be fed directly into a FFS machine to make reclosable bags.

[0015] In the third aspect of the present invention the thermoplastic film with the transverse zipper strips attached at bag length intervals is fed into the FFS machine where it is formed into a bag, filled, and sealed. Specifically, the transverse zipper-equipped thermoplastic film is folded over the collar of the FFS machine and wrapped around the filling tube to form a tube. The longitudinal edges are then sealed to form a back seam. The transverse sealing jaws then seal the bottom of the tube to form an open bag. The bag is then filled, if desired. Finally, the transverse sealing jaws seal the portions of the leading flanges between the perforation and the interlocking members to the bag without sealing them to each other and seal the top of the bag so as to make a completed bag.

[0016] In accordance with the fourth aspect of the present invention, the finished bag is opened by pulling outwardly on the bag walls, which pulling results in the breaking of the perforation, thereby separating the pro-

files, disengagement of the interlocking members, and opening of the top seal, thus giving the consumer access to the interior of the bag.

[0017] Particular embodiments of the present invention will now be described with reference to the accompanying drawings in which:-

Figure 1 is a cross-sectional view of a zipper strip in accordance with the one embodiment of the invention;

Figure 2 is a plan view of a length of the zipper strip; Figure 3 is a perspective view of the zipper strip being attached to thermoplastic film;

Figure 4 is a cross-sectional view of the zipper strip and the thermoplastic film after the leading flanges of the zipper strip have been attached thereto;

Figure 5 is a cross-sectional view of an alternate zipper strip which may be used to practice the present invention;

Figure 6 is a cross-sectional view of an alternate zipper strip which may be used to practice the present invention;

Figure 7 is a cross-sectional view of an alternate zipper strip which may be used to practice the present invention;

Figure 8 is a perspective view of an FFS machine used to make transverse-zippered reclosable plastic bags;

Figure 9 is a cross-sectional view of the FFS machine cross-seal jaws disposed to complete the top of a bag and the bottom of a succeeding bag;

Figure 10 is a cross-sectional view of a sealed completed bag;

Figure 11 is a cross-sectional view of an open completed bag; and

Figure 12 is a cross-sectional of an alternate sealed completed bag in accordance with the present invention.

[0018] Referring specifically to the figures identified above, Figure 1 is a cross-sectional view of a zipper strip 10 in accordance with the first aspect of the present invention.

[0019] The zipper strip 10 comprises a male profile 12 and a female profile 14. The profiles 12, 14 are made of a plastic commonly used in the packaging industry, such as polyethylene. The male profile 12 has a male interlocking member 16 which may have an arrow-shaped cross-section, or as shown in Figure 1, an asymmetrical arrow-shaped cross section designed to make the zipper strip 10 easier to open from one side or the other. The female profile 14 includes a female interlocking member 18 comprising two inwardly curving members forming a receptacle or channel into which male interlocking member 16 may be engaged. It should be noted that while these configurations for male and female members 16, 18 are preferred, any configuration which provides for interlocking may be used.

[0020] The male and female profiles 12, 14 include male and female leading flanges 22, 24 and male and female trailing flanges 26, 28 which are defined by a folded U-shaped web 20 which may be coextruded with male and female interlocking members 16, 18 or extruded separately and attached at a later time.

[0021] The leading flanges 22, 24 are so called because these flanges first enter the FFS machine after the zipper strip 10 is attached to the thermoplastic film. Ultimately, the leading flanges 22, 24 will reside inward of the mouth of the plastic bag or package manufactured on the FFS machine. The web 20 may be equipped with a heat activated adhesive 30 to aid in the sealing of the zipper strip 10 to the film.

[0022] Figure 2 is a plan view of a length of the zipper strip 10. As is clear from Figures 1 and 2, the female leading flange 24 is provided with a weak perforation 32 across its length so that the female leading flange 24 may be separated by pulling the profiles 12, 14 apart. As discussed below, the perforation 32 allows the consumer to gain access to the contents of the bag upon first opening the same.

[0023] Figure 3 depicts how a zipper strip 10 is attached to the thermoplastic film 34 having a longitudinal axis X in accordance with the present invention. The zipper strip 10 is supplied from a continuous roll 35 and is pulled or pushed across the film 34 and disposed thereon by a positioning device 72 (not shown in Figure 3 for clarity). The positioning device 72 can take any of a variety of forms well known to those skilled in the reclosable packaging art, such as a vacuum conveyor for pulling the zipper strip 10 across the film 34 and a knife for cutting the zipper strip 10 from the continuous roll thereof 35.

[0024] The thermoplastic film 34 is paid off from a continuous roll 36, as shown in Figure 3, in increments equal to the length of the bags which will ultimately be formed from the film 34. The longitudinal axis of the film 34 is parallel to the direction of travel of the film 34. Each time the film 34 comes to rest, the zipper strip 10 is disposed on the film 34 transverse to the longitudinal axis X with one of the profiles on top of the other profile and the leading flanges 22, 24 projecting in the direction of motion of the film 34. The orientation of the profiles depends on which side of the zipper, if any, is adapted to be the opening side. As disclosed in US-A-4,909,017, the zipper strip 10 has a length approximately equal to half the width of the film 34 and is disposed centrally thereon. Heater seal bars 37 are positioned to seal the portions of the leading flanges 22, 24 on the side of the perforation 32 opposite to the interlocking members 16, 18 to the film 34 and to each other.

[0025] Figure 4 shows a cross section of the zipper strip 10 and the film 34 after the zipper strip 10 has been sealed thereto. The portions of the leading flanges 22, 24 to the left of the perforation are sealed to each other and to the film at 38. Seal 38 may be a spot seal or a full seal across the length of the flanges. The film 34 is

thus able to carry the strip 10 into the FFS machine, and the perforation 32 is strong enough such that there is no danger of the perforation 32 breaking and causing female leading flange 24 to flare out and jam the FFS machine or to otherwise get caught in the machine and pull the zipper strip 10 apart. The transverse zipper-equipped material may either be re-rolled for later use on a FFS machine, or may be fed directly into a FFS machine to make reclosable bags.

[0026] Alternate embodiments of the zipper strip 10 may be used to practice the present invention. Figures 5, 6 and 7 show examples of these alternate embodiments. In Figure 5, the leading flanges 22, 24 are initially separated and are attached to each other at 39, such as by heat sealing or through the use of an adhesive, either in the factory, ahead of the FFS machine, or at the FFS machine. This zipper strip may then be attached to the thermoplastic film in the same manner as the strip of Figure 1. Alternatively, this zipper strip may be disposed on the thermoplastic film with the leading flanges detached, the sealing bars sealing the leading flanges to each other for the first time. In Figure 6, the web 20 is U-shaped as in the embodiment of Figure 1. However, the leading flanges 24, 26 are presealed to each other at 41, which presealed area is sealed to the thermoplastic film. In Figure 7, the web is extruded with a nose 43 which joins the leading flanges 22, 24 and which is sealed to the thermoplastic film.

[0027] In the third aspect of the present invention, the transverse zipper-equipped film is fed into an FFS machine, as shown in Figure 8. The thermoplastic film 34 is fed downwardly over collar 40 and folded around filling tube 42. The edges of the film are brought together and pressed together by a pair of rollers 44. The edges are then welded together by heater bars 46 to form a longitudinal back seam 48. Contents may then be dropped through the tube 42 into the bag 50 which has a lower seam 52. As discussed below, the lower seam 52 was made when the preceding bag was completed.

[0028] After introduction of the contents, the top of the bag is completed by the action of cross seal jaws 54, which perform five simultaneous functions. First, as shown in Figure 9 which is a cross sectional view of bag 50 and cross seal jaws 54, cross seal jaw portions 60 seal the portions of the leading flanges 22, 24 between the perforation and the interlocking members to the front and back walls 56, 58 of the bag without sealing them to each other. Second, cross seal jaw portions 62 seal the trailing flanges 26, 28 of the zipper strip 10 to the front and back walls 56, 58 without sealing the trailing flanges 26, 28 to each other. The use of the heat activated adhesive 30 makes it possible to seal the flanges to the bag walls 56, 58 without sealing the flanges to each other. Third, cross seal jaw portions 64 seal the top of the bag to form a pilfer evident seal 70. Fourth, cross seal jaw portions 66 make the lower seam 52 for the next succeeding bag. And fifth, knife portions 68 cut the completed bag 50 from the film 34. The completed

bag 50 has a pilfer evident seal 70, a transverse zipper 10, a lower seam 54 and a back seam 48.

[0029] In accordance with the fourth aspect of the present invention, a cross section of the completed bag 50 is shown in Figure 10. Connected male and female profiles 12, 14 are each sealed to the opposite bag walls 56, 58. This four-flange seal, as discussed above, eliminates any zipper peeling problems and opening mechanics problems.

[0030] A consumer desiring to gain access to the contents of the bag need only pull outwardly on the bag walls 56, 58 as shown by arrows A. This pulling action will first cause perforation 32 to break, thereby separating the profiles 12, 14. Next, the interlocking members 16, 18 will separate. And third, the pilfer evident seal 70 will open. The consumer thus has access to the interior of the bag as shown in Figure 11, which bag may be reclosed by the interlocking of the profiles 12, 14.

[0031] In an alternate embodiment the zipper strip can be provided at the bottom of the bag 50, as shown in Figure 11. It would be a simple matter to one skilled in the art to modify the operation of the FFS machine, as discussed above, to produce such bags. A consumer would, of course, re-orient the bag during use so that the zipper strip is at the top. However, the vertical orientation of the zipper strip is reversed, resulting in different opening mechanics. When the bag of Figure 11 is initially opened, first the interlocking members 16, 18 separate, then the perforation 32 breaks, and finally the pilfer evident seal 70 opens.

Claims

1. A zipper strip for a reclosable package having first and second opposing walls, said zipper strip comprising:

a male interlocking profile, said male interlocking profile including a male interlocking member and an integral web defining a male leading flange;

a female interlocking profile, said female interlocking profile including a female interlocking member and an integral web defining a female leading flange, said male interlocking member being engageable within said female interlocking member to join said male and female interlocking profiles together;

wherein one of said leading flanges is provided with a perforation along its length, said perforation defining a first seal area on said one of said leading flanges on the side of said perforation opposite to said interlocking members, a second seal area on said one of said leading flanges on the same side of said perforation as said interlocking members, a third seal area on the other leading flange opposite to said first

seal area, and a fourth seal area on the other leading flange opposite to said second seal area;

wherein the leading flange having said perforation is sealable to the other leading flange at said first seal area;

wherein the other leading flange is sealable to said first package wall at said third seal area; wherein the leading flange having said perforation is sealable to said second package wall at said second seal area; and wherein the other leading flange is sealable to said first package wall at said fourth seal area.

2. A zipper strip according to claim 1 wherein said male leading flange is connected to said female leading flange on the side of said perforation opposite to said interlocking members.

3. A zipper strip according to claim 1: wherein said male web further defines a male trailing flange; and

wherein said female web further defines a female trailing flange;
said trailing flanges being sealable to opposing package walls.

4. A zipper strip according to claim 1 wherein said leading flanges are presealed to each other at said first seal area.

5. A zipper strip for a reclosable package having first and second opposing walls, said zipper strip comprising:

a male interlocking profile, said male interlocking profile including a male interlocking member and an integral web defining a male leading flange;

a female interlocking profile, said female interlocking profile including a female interlocking member and an integral web defining a female leading flange, said male interlocking member being engageable within said female interlocking member to join said male and female interlocking profiles together;

and a nose portion joining said leading flanges; wherein one of said leading flanges is provided with a perforation along its length with said nose portion located on the side of said perforation opposite to said interlocking members, said perforation defining a first seal area on said one of said leading flanges on the same side of said perforation as said interlocking members and a second seal area on the other leading flange opposite to said first seal area; wherein said nose portion is sealable to one of said package walls; wherein the leading flange

having said perforation is sealable to the other package wall at said first seal area; and wherein the other leading flange is sealable to the same package wall as said nose portion at said second seal area.

6. A method for attaching a zipper strip transversely to thermoplastic film for use in the production of reclosable packages to be made on a form-fill-seal machine from said thermoplastic film, said method comprising the steps:

providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;

providing a length of zipper strip having interlocked male and female profiles; said male profile including a male interlocking member and an integral web defining a male leading flange; said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; wherein one of said leading flanges is provided with a perforation along its length;

disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said leading flanges directed in the direction of motion of said thermoplastic film each time said film is brought to rest; and sealing said leading flanges to each other and to said thermoplastic film on the side of said perforation opposite to said interlocking members.

7. A method for attaching a zipper strip transversely to thermoplastic film for use in the production of reclosable packages to be made on a form-fill-seal machine from said thermoplastic film, said method comprising the steps:

providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;

providing a length of zipper strip having interlocked male and female profiles; said male profile including a male interlocking member and an integral web defining a male leading flange; said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; wherein one of said leading flanges is provided with a perforation along its length; and wherein said leading flanges are sealed to each other on the side of said perforation opposite to said interlocking members;

disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said leading flanges directed in the direction of motion of said thermoplastic film each time said film is brought to rest; and sealing the lower leading flange to said thermoplastic film on the side of said perforation opposite to said interlocking members.

8. A method for attaching a zipper strip transversely to thermoplastic film for use in the production of reclosable packages to be made on a form-fill-seal machine from said thermoplastic film, said method comprising the steps:

providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;

providing a length of zipper strip having interlocked male and female profiles and a nose portion; said male profile including a male interlocking member and an integral web defining a male leading flange; said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; said leading flanges being connected by said nose portion; wherein one of said leading flanges is provided with a perforation along its length; and wherein said nose portion is located on the side of said perforation opposite to said interlocking members;

disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said nose portion directed in the direction of motion of said thermoplastic film each time said film is brought to rest; and sealing said nose portion to said thermoplastic film.

9. A method of making reclosable packages comprising the steps of:

providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;

providing a length of zipper strip having male and female interlocking profiles; said male profile including a male interlocking member and an integral web defining a male leading flange; said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; wherein one of said leading flanges is provided with a perforation along its length;

- disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said leading flanges directed in the direction of motion of said thermoplastic film each time said film is brought to rest; sealing said leading flanges to each other and to said thermoplastic film on the side of said perforation opposite to said interlocking members; forming the package; and thereafter sealing said leading flanges to the inner surfaces of opposing package walls on the same side of said perforation as said interlocking members without sealing said leading flanges to each other so that said profiles will be on opposing inner surfaces at the package opening.
10. A method according to claim 9 wherein said package is seamed after it is formed.
11. A method according to claim 9 wherein said profiles are sealed to the package adjacent the top end.
12. A method according to claim 9 wherein said zipper strip is disposed upon said thermoplastic film by moving transversely across said longitudinal axis.
13. A method according to claim 9 wherein said package is formed by drawing said thermoplastic film forwardly over a tube to join the longitudinal edges of said thermoplastic film.
14. A method according to claim 9 wherein the longitudinal edges of said thermoplastic film are joined in a back seam prior to sealing said leading flanges to said package wall inner surfaces.
15. A method according to claim 9 wherein said zipper strip length is substantially equal to one-half the width of said thermoplastic film.
16. The method according to claim 9 wherein said zipper strip is sealed to said thermoplastic film at the center thereof midway between the longitudinal edges.
17. The method according to claim 9 including the step of cross-sealing said package above said zipper strip to form the bottom end of a succeeding package.
18. The method according to claim 17 including the step of cutting said thermoplastic film between said cross seal and said zipper strip to remove a completed package from said thermoplastic film.
19. A method according to claim 9 wherein said profiles are sealed to the package adjacent the bottom end.
20. A method of making reclosable packages comprising the steps of:
- providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;
- providing a length of zipper strip having interlocked male and female profiles; said male profile including a male interlocking member and an integral web defining a male leading flange; said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; wherein one of said leading flanges is provided with a perforation along its length; and wherein said leading flanges are sealed to each other on the side of said perforation opposite to said interlocking members;
- disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said leading flanges directed in the direction of motion of said thermoplastic film each time said film is brought to rest; sealing the lower leading flange to said thermoplastic film on the side of said perforation opposite to said interlocking members;
- forming the package; and thereafter sealing said leading flanges to the inner surfaces of opposing package walls on the same side of said perforation as said interlocking members without sealing said leading flanges to each other so that said profiles will be on opposing inner surfaces at the package opening.
21. A method of making reclosable packages comprising the steps of:
- providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;
- providing a length of zipper strip having interlocked male and female profiles and a nose portion; said male profile including a male interlocking member and an integral web defining a male leading flange; said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; said leading flanges being connected by said nose portion; wherein one of said leading flanges is provided with a perforation along its length; and wherein said nose portion is located

on the side of said perforation opposite to said interlocking members;
 disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said nose portion directed in the direction of motion of said thermoplastic film each time said film is brought to rest;
 sealing said nose portion to said thermoplastic film;
 forming the package; and
 thereafter sealing said leading flanges to the inner surfaces of opposing package walls on the same side of said perforation as said interlocking members without sealing said leading flanges to each other so that said profiles will be on opposing inner surfaces at the package opening.

22. A method of making reclosable packages comprising the steps of:

providing thermoplastic film having a longitudinal axis and advancing said thermoplastic film along said axis in amounts equal in length to that of said packages;
 providing a length of zipper strip having male and female interlocking profiles; said male profile including a male interlocking member and an integral web defining a male leading flange;
 said female interlocking profile including a female interlocking member and an integral web defining a female leading flange; wherein one of said leading flanges is provided with a perforation along its length;
 disposing said length of zipper strip upon said film transversely to said longitudinal axis with one of said profiles positioned above the other of said profiles and said leading flanges directed in the direction of motion of said thermoplastic film each time said film is brought to rest;
 sealing said leading flanges to each other and to said thermoplastic film on the side of said perforation opposite to said interlocking members;
 folding said thermoplastic film so as to bring the longitudinal edges together;
 sealing the longitudinal edges to form a package having front and back walls;
 sealing said leading flanges to the inner surfaces of said package walls on the same side of said perforation as said interlocking members without sealing said leading flanges to each other;
 cross sealing said package walls to each other above said zipper strip to form the bottom end of a succeeding package; and
 cutting said thermoplastic film between said

cross seal and said zipper strip to remove a completed package from said thermoplastic the film.

23. A reclosable package comprising:

first wall and a second wall opposite said first wall;
 a zipper strip for selectively opening and closing said package, said zipper strip comprising a male interlocking profile extending along an internal surface of said first wall and a female interlocking profile extending along an internal surface of said second wall;
 said male interlocking profile including a male interlocking member and an integral web defining a male leading flange;
 said female interlocking profile including a female interlocking member and an integral web defining a female leading flange, said male interlocking member being engageable within said female interlocking member to join said male and female interlocking profiles together;
 wherein said leading flanges are sealed to each other and to one of said package wall internal surfaces at a first seal area;
 wherein said male leading flange is sealed to said first wall internal surface at a second seal area and said female leading flange is sealed to said second wall internal surface at a third seal area opposite to said second seal area;
 and
 wherein one of said leading flanges is provided with a perforation along its length adjacent to said first seal area so that said profiles can be separated when said package walls are pulled apart to initially open said package.

24. A reclosable package according to claim 23:

wherein said male web further defines a male trailing flange which is sealed to said first wall internal surface; and
 wherein said female web further defines a female trailing flange which is sealed to said second wall internal surface.

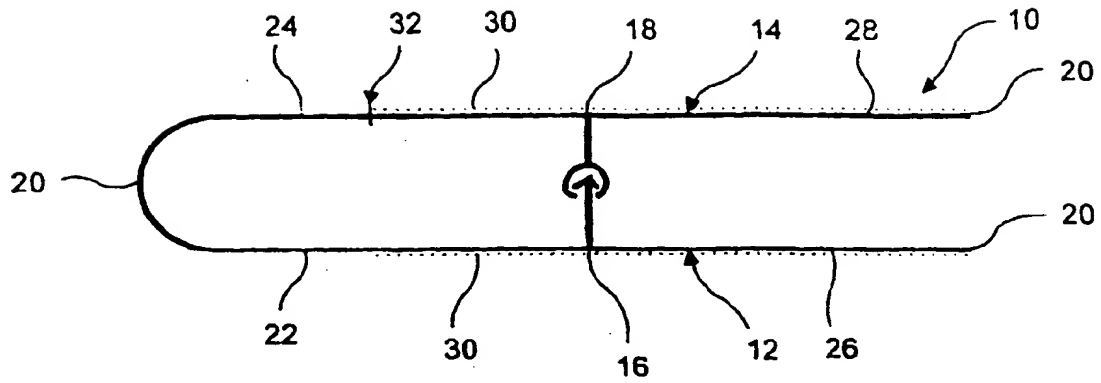


FIG. 1

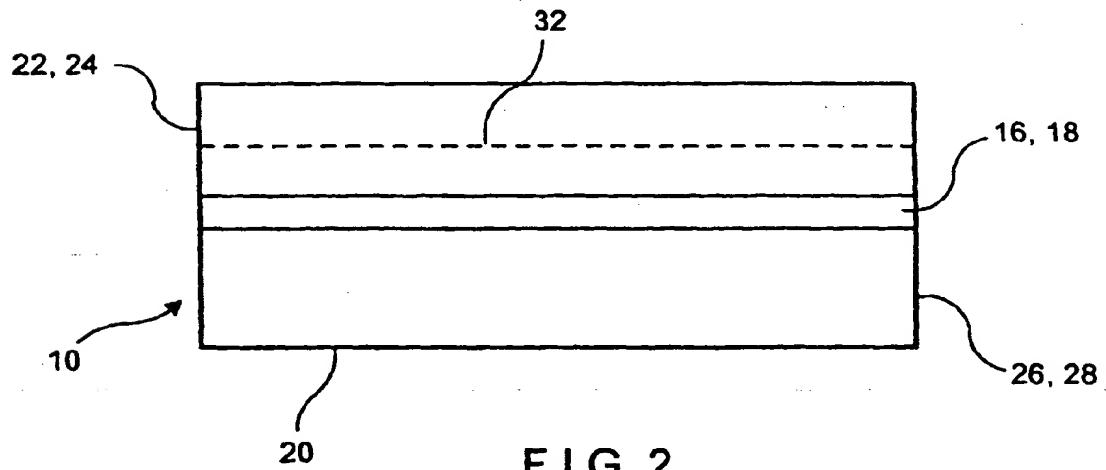


FIG. 2

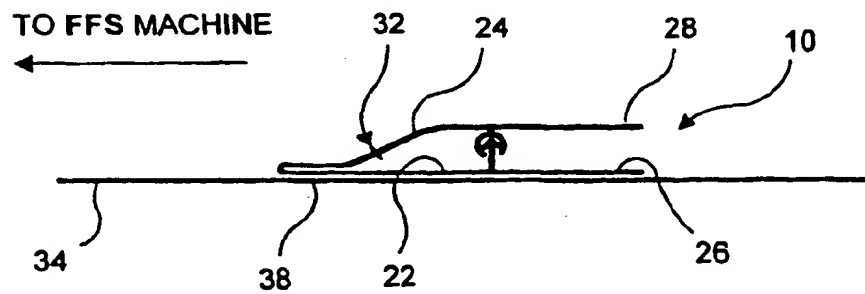
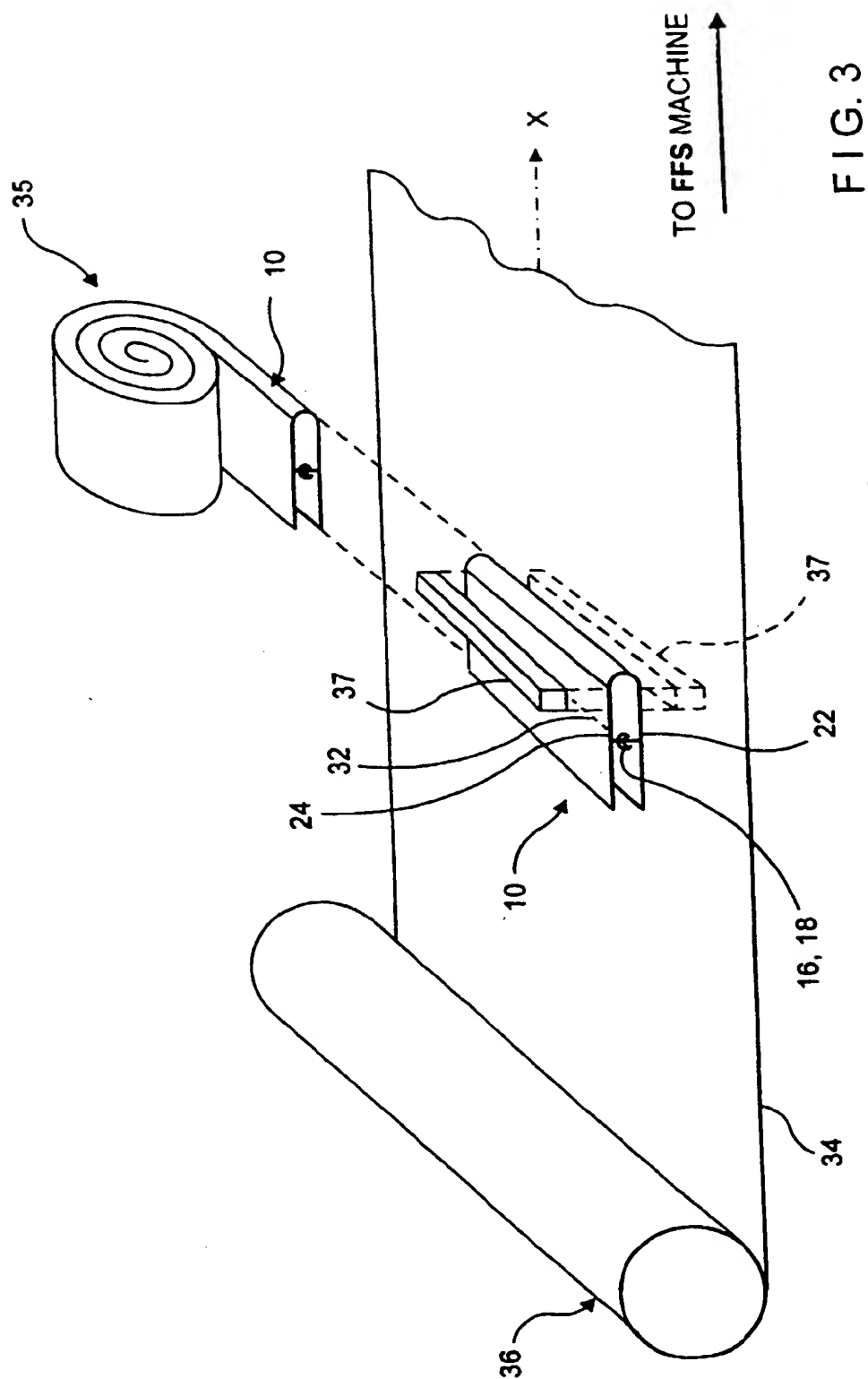


FIG. 4



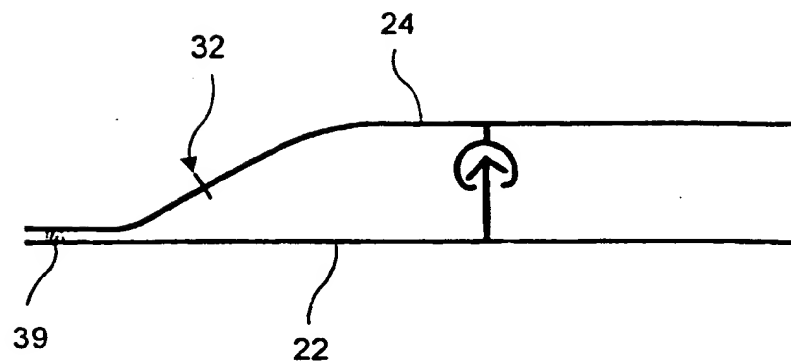


FIG. 5

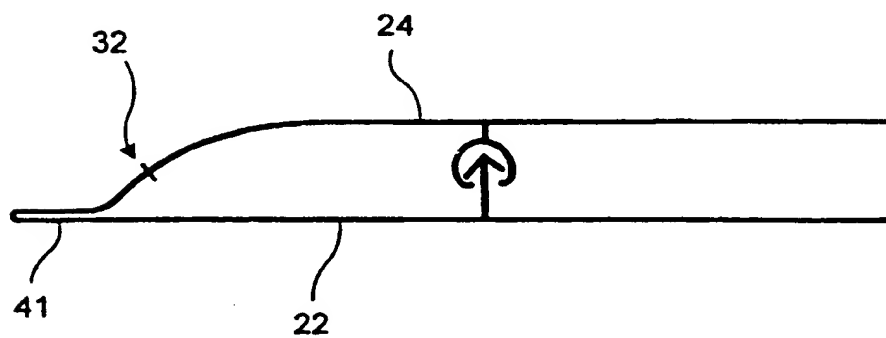


FIG. 6

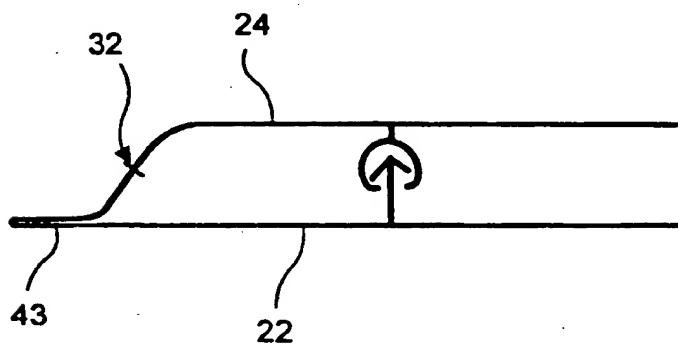
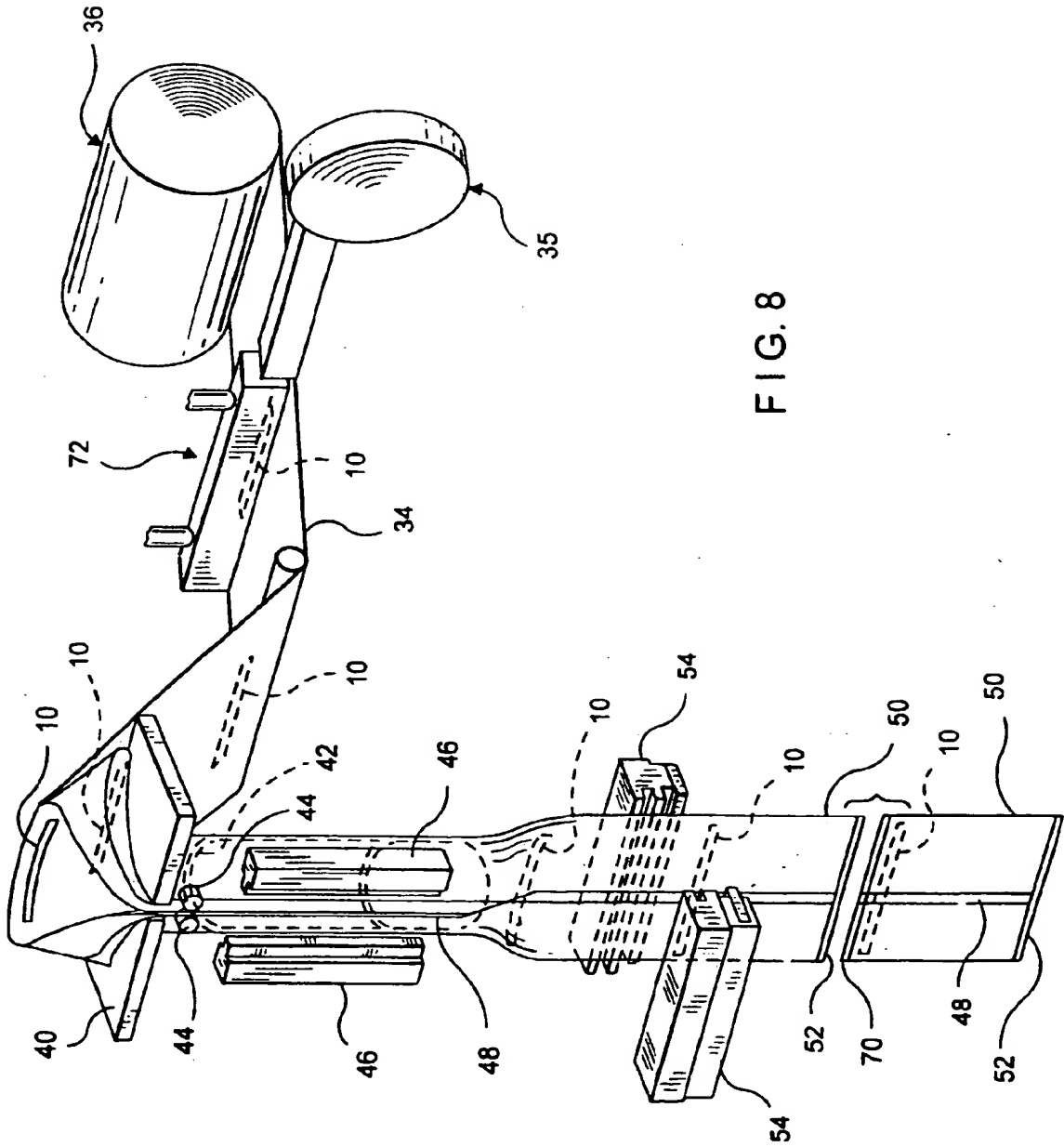


FIG. 7



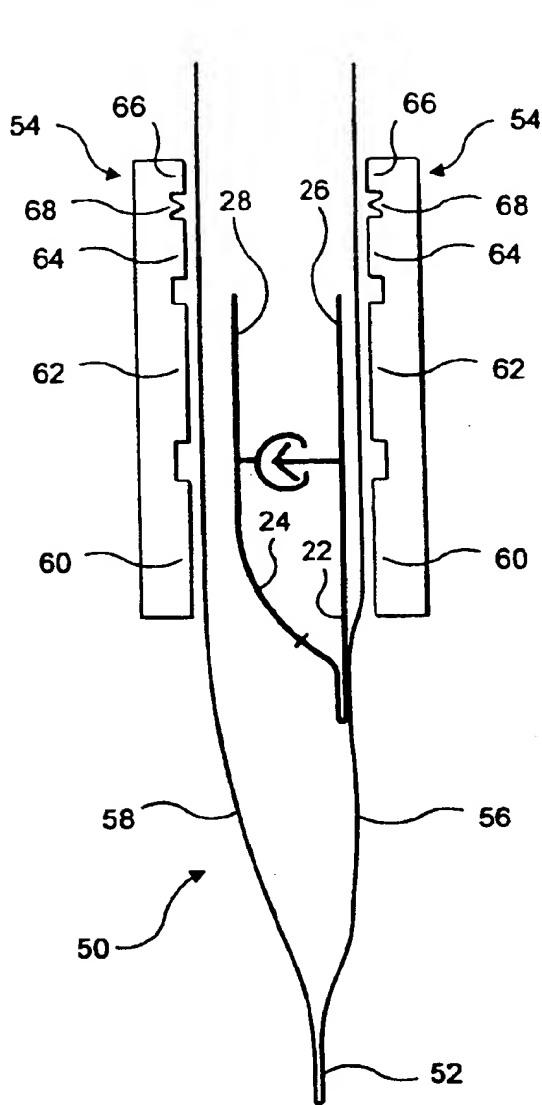


FIG. 9

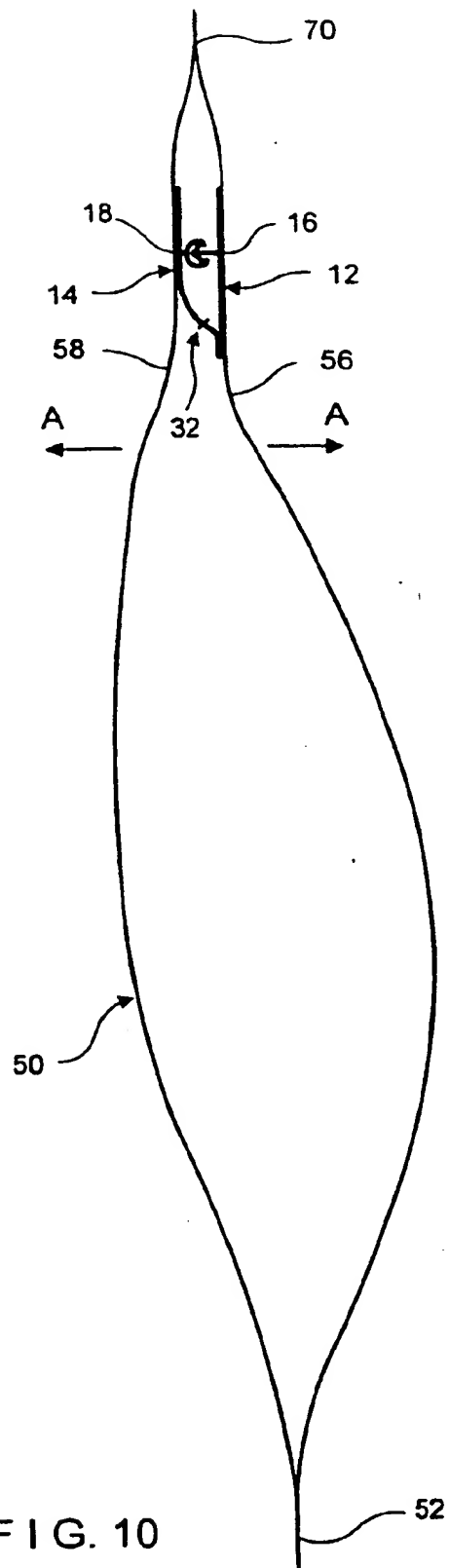


FIG. 10

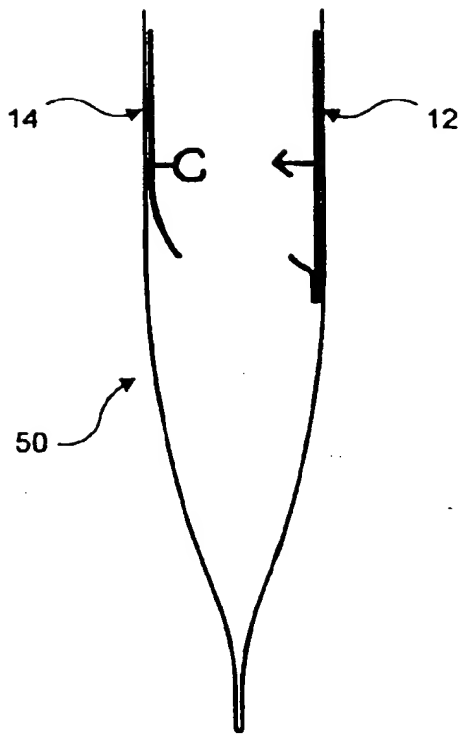


FIG. 11

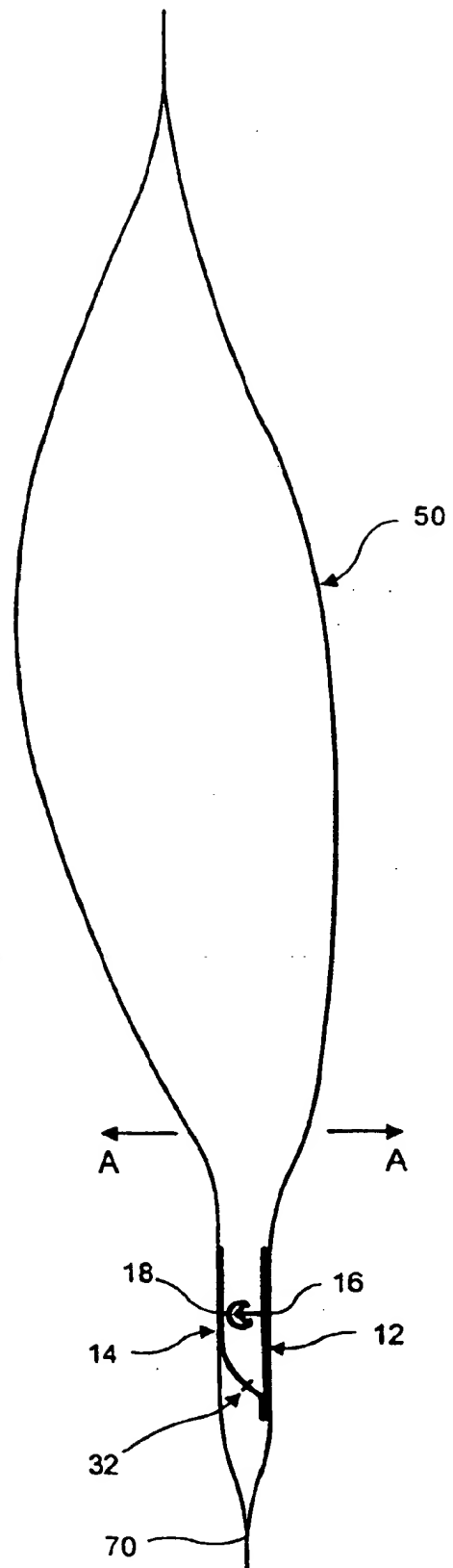
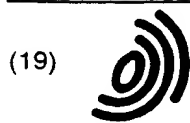


FIG. 12



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(54) **Transverse direction zipper tape**

(57) A zipper strip for a reclosable package having a transverse zipper is provided. The zipper strip comprises a male interlocking profile (12) and a female interlocking profile (14). Each profile includes an interlocking member (16,18) and an integral web which defines

a leading flange. The leading flanges (22,24) are sealed to thermoplastic film material which is used to make the reclosable packages and to each other. One of leading flanges is provided with a perforation (32) along its length so that it can be separated by pulling the profiles apart.

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EUROPEAN SEARCH REPORT

Application Number
EP 99 30 3718

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	US 5 085 031 A (ZIP-PAK) 4 February 1992 (1992-02-04)	1-4	B65D33/25
Y	* column 2, line 28 - column 3, line 61; figures 1-7 *	5-7, 9-20, 22-24	
Y	EP 0 302 144 A (MINIGRIP) 8 February 1989 (1989-02-08)	5	
A	* column 4, line 36 - column 5, line 40; figures 5,6 *	8,21	
Y,D	US 4 909 017 A (MINIGRIP) 20 March 1990 (1990-03-20)	6,7, 9-20, 22-24	
A	FR 2 744 700 A (FLEXICO) 14 August 1997 (1997-08-14) * page 2, line 1 - page 4, line 9; figures 3-5 *	5,8,21	<p>TECHNICAL FIELDS SEARCHED (Int.Cl.6)</p> <p>B65D</p>
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 25 August 1999	Examiner Lenoir, C
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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ON EUROPEAN PATENT APPLICATION NO.**

EP 99 30 3718

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25-08-1999

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 5085031	A	04-02-1992	NONE	
EP 302144	A	08-02-1989	US 4925316 A	15-05-1990
			AT 73085 T	15-03-1992
			DE 3777176 A	09-04-1992
			DE 3789974 D	07-07-1994
			DE 3789974 T	03-11-1994
			DK 71193 A	15-06-1993
			DK 688687 A	07-02-1989
			EP 0456277 A	13-11-1991
			ES 2056527 T	01-10-1994
			FI 875682 A, B,	07-02-1989
			NO 173695 C	19-01-1994
US 4909017	A	20-03-1990	AU 621493 B	12-03-1992
			AU 5684890 A	31-01-1991
			CA 2018436 A	28-01-1991
			EP 0410126 A	30-01-1991
			JP 3069410 A	25-03-1991
FR 2744700	A	14-08-1997	NONE	

EPO FORM P0459

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